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ABSTRACT

A survey sent to parents of 1,189 students in grades 1 through 8 in three school districts explored the connection between family history of diabetes mellitus and learning or behavior problems. A yield of 816 returns gave results such as the following: of 418 returns for males, 233 students had a diabetic background (BG); of 398 returns for females, 211 students had a diabetic BG; 145 males and 60 females with diabetic BG had school related problems; and although more females had a diabetic BG than males, more males had a history of school related problems than females. The results indicated that there may be a connection between family history of diabetes and learning problems. The report contains numerous tables and statistics. (MC)

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TO: Palmyra School District
Swedesboro-Woolwich School District
Lower Township School District

FROM: Helen G. Groff

RE: Project to explore the possibility of a connection between a family history of diabetes mellitus and school learning and/or behavior problems in students in grades one to eight.

DATE: August 11, 1982

In October of 1981 a letter was sent to the parents of 1,189 students, grades one to eight, asking if there was a family history of diabetes. If there was such a history, they were to identify if the person or persons was/were: the student, the mother or father, maternal grandmother or grandfather, paternal grandmother or grandfather, others in mother's family, or others in father's family.

The original sample included every student in the Swedesboro, N.J. school district, grades one to six, in the Lower Township, N.J. school district, grades three to six; and in the Palmyra, N.J. school district, grades five to eight.

Eight hundred and nineteen letters were returned by parents to their district superintendents. Returns from three adopted students were excluded from the study because a diabetic history could neither be confirmed nor denied. This represents a return of 69 percent. The return from the three schools ranged from 67.3 percent to seventy-one percent. There was no follow-up or second request for information.

The original sample contained 614 males and 575 females. The 816 usable returns were received for 418 males and 398 females. (See Table I.)

School personnel were asked to report on the academic record of students with a family history of diabetes (see attached form). This information from the three school districts was combined with the following results.

HGG:lew

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EC151698

PALMYRA PUBLIC SCHOOLS

PALMYRA, N. J. 08065

DANIEL R. MASTROBUONO
Superintendent of Schools
829-0244

Administrative Offices
700 Cinnaminson Avenue

KENNETH F. BYE
Business Administrator
Board Secretary
829-0426

To the parents of

The Board of Education has approved our participation in an important study being conducted by the Educational Improvement Center-South, examining the possible connection between family history of diabetes and some specific learning problems.

The problem of "learning disabilities" has been plaguing education for many years and there is a possibility we have a clue to one of its causes.

This letter will be sent to every student in the Charles Street School. The privacy of all students will be protected, as the results will be reported by number only. No names will be used. In order to get good results, it is important that every letter be returned.

Please complete the information below and return this letter in the self-addressed, stamped envelope.

Is there a history of diabetes in the family? Yes_____ No_____

If the answer is "yes", please check which family members have this history:

_____Student
_____Father
_____Mother
_____Maternal Grandmother
_____Maternal Grandfather
_____Paternal Grandmother
_____Paternal Grandfather
Other relative:
_____ Mother's Family
_____ Father's Family

The results of the research will be given to your Board of Education.

Thank you for your help.

Sincerely,

Daniel R. Mastrobuono

DM:e

Daniel Mastrobuono, Ed.D.
Superintendent

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Form To Be Filled Out by School Personnel
for Students with Diabetic History

Student #_____

Male_____ Female_____

Diabetic History (Bottom of letter may be photocopied and attached)

_____

_____

_____

History of School Achievement or Problems

Is student assigned to a special education class? Yes_____ No_____

If student is classified, list classification _____

Identified learning problems Reading _____

Math _____

Handwriting _____

Is student in Comp. Ed. program? Yes_____ No_____

Is the student of average, below average, or above average intelligence?

Below 90 Below Average_____
90-110 Average _____
110 Above Average_____*

*If above average, is student considered an underachiever? Yes_____ No_____

Does the child have a behavior problem? Yes_____ No_____

Remarks:

TABLE # 1 Comparison of Ratio of Males and Females With and Without Diabetic Backgrounds

	ORIGINAL SAMPLE	USABLE RESPONSES	STUDENTS WITH DIABETIC BACKGROUND	STUDENTS WITHOUT DIABETIC BACKGROUND
MALES	614 (52%)	418 (51%)	233 (52.6%)	185 (50%)
FEMALES	575 (48%)	398 (49%)	211 (47.4%)	187 (50%)
TOTAL	1,189 (100%)	816 (100%)	444 (100%)	372 (100%)
	Total Usable Responses 69% of Original Sample		*444 Represents 54% of Usable Responses	372 Represents 46% of Usable Responses

* It was unexpected that 54% of the students would have a diabetic background.

The following table (#2) represents important tentative findings regarding the incidence of school related problems in males and females with a diabetic background.

These figures which show that many more males are affected is in agreement with the research on learning problems.

TABLE # 2 Incidence Rate of Diabetic Background With and Without School Related Problems

	Males	Females
Diabetic BG With school related problems	145 (62%)	60 (28%)
Diabetic BG Without school related problems	88 (38%)	151 (72%)
Total with Diabetic Background	233 (100%)	211 (100%)

The following table (#3) shows the percentage of males compared to females that have school problems and a diabetic background, and those with no school problems and a diabetic background. As stated above, it is well known that students with reading, math, handwriting and/or behavior deficits are predominately males at a rate of 70% (or higher) compared to 30% for females.

TABLE # 3 Comparison Ratio of Males and Female With Diabetic Background With and Without Problems

	Students with DB and School Problems	Students with DB No School Problems
Males	145 (71%)	88 (37%)
Females	60 (29%)	151 (63%)
Total	205 (100%)	239 (100%)

In order to determine where the diabetic history for each student was, a study was made of how many students had a family diabetic history on the mother's side of the family or the father's side of the family, or on both sides of the family. According to the statistics below a much larger percentage of diabetic history is on the mother's side.

TABLE # 4 Incidence of Diabetic Background by Geneology

	Diabetic Background on Mother's Side Only	Diabetic Background on Father's Side Only	Diabetic Background on Both Sides Of Family	Totals
Males	101 (47%)	70 (61%)	62 (54%)	233
Females	114 (53%)	45 (39%)	52 (46%)	211
Total	*215 (100%)	**115 (100%)	***114 (100%)	444

* 48.4% of total diabetic history for all students is on Mother's side only

** 25.9% of total diabetic history on Father's side only

*** 25.7% of total diabetic history on both Mother's and Father's side

A very interesting conclusion, showed that although more females (114) or 53% had a family history of Diabetes on the mother's side only, as compared to (101) or 47% for males, the male appears to be more vulnerable which agrees with the research (70-30%) literature as shown below.

of the 101 males who had a family history of Diabetes on the mother's side only, 70 or 69% had school related problems.

of the 114 females who had a family history of Diabetes on the mother's side only, 34 or 30% had school related problems.

45 females had diabetic family background - father's side only
13 or 29% had school related problems.

Males again seemed more vulnerable
70 males had a diabetic family background - father's side only
40 or 57% had school related problems

52 females had diabetic background - both sides of the family
13 or 25% had school related problems

62 males had a diabetic background - both sides of the family
35 or 56% had school related problems

5 students - 3 females and 2 males had juvenile diabetes but only 1 female had school problems.

25 students had mothers with Diabetes (and others on the mother's side of the family)

9 males (7 with school problems) 77%
16 females (4 with school problems) 25%

91 students had a maternal grandmother with Diabetes (and others on the mother's side)

41 males (31 with school problems) 76%
50 females (15 with school problems) 30%

57 students had a maternal grandfather with Diabetes (plus others in the mother's family)

29 males (23 with school problems) 79%
28 females (11 with school problems) 38%

136 students had a family history in mother's extended family, plus others in immediate family

68 males (53 problems) 78%
68 females 17 problems) 25%

8 students had fathers with Diabetes (and others on father's side)

4 males (2 with school problems) 50%
4 females (2 with school problems) 50%

40 students had a paternal grandmother with Diabetes (and others in father's family)

25 males (15 with school problems) 60%
15 females (6 with school problems) 40%

38 students had a paternal grandfather with Diabetes (plus other members of father's family)

20 males (15 with school problems) 75%
18 females (4 with school problems) 22%

66 had Diabetes in father's extended family (plus some in immediate family)

40 males (18 with school problems) 45%
26 females (6 with school problems) 23%

These preliminary results, plus a further breakdown by school and related statistics, have caused us to reach the tentative conclusion that there may be a connection between a family history of Diabetes Mellitus and learning problems in children.

There is much more to be done. The control group has been identified (those students without a diabetic family history) in the same 3 schools. We have asked that they fill out the same academic record (see exhibit #2) for these students so that we can be sure that our results can be confirmed.

This project is not a research study. We are entirely dependent on the information and perceptions relayed to us by the school districts. This was necessary to protect the privacy of student records, however, the consistency of the information received from all three districts leads us to believe that the information we received is valid and reliable.

The leadership of the three superintendents involved, Dr. Mastrobuono of Palmyra, Edwin Hallanan of Swedesboro and Edward Campbell of Lower Township was the driving force in this very difficult and time consuming work.

The results from the first control group, Palmyra Public Schools, grades 5 to 8 is attached. We believe this control group is more relevant than the others. Because we are dealing with a disease that is identified primarily in an aging population, the older the age of students, the more accurate the picture of the family history will be.

* The statistics from the other two schools (including control groups) are now completed, and attached. Also the statistics for the 3 schools combined.

Palmyra-Control Group

Compilation of statistics comparing control group (those females with no family diabetic history) from Palmyra, (grades 5 to 8) with original group of students identified as having a family history of diabetes and the incidence of specific school related problems in each group.

TABLE # 5 Palmyra-Females-Grades 5-8

CONTROL GROUP

School Problems	With Diabetic Background 55 Students 49 Not Classified		Without Diabetic Background 67 Students 63 Not Classified	
	Number (Problem Incidence)	Percentage	Number (Problem Incidence)	Percentage
Spec. Ed. Classification	6	11 %	4	6.4%
*In Compensatory Ed. Class	** (27) 15	30.6%	** (7) 7	11 %
*Reading Problems	13	26.5%	3	4.8%
*Math Problems	16	32.7%	5	8 %
*Handwriting	0	0	0	0
*Considered Underachiever	3	6 %	3	5 %
*Behavior Deficits	1	2 %	2	3 %
Total Problems 78	** (66) 54	74 %	** (24) 24	26 %

*Starred school problems do not include specific problems of classified students--they were not reported.

45% of females have diabetic family history
9% of females are classified

**If students have multiple problems and are in both compensatory education classes (Reading and Mathematics), they are counted twice in these figures.

TABLE # 6 Palmyra-Males-Grades 5-8

School Problems	With Diabetic Background 52 Students 49 Not Classified		Without Diabetic Background 53 Students 46 Not Classified	
	Number (Problem Incidence)	Percentage	Number (Problem Incidence)	Percentage
Spec. Ed. Classification	3	5.8%	7	13.2%
*In Compensatory Ed. Classes	** (40) 27	55 %	** (6) 5	10.9%
*Reading Problems	24	49 %	3	6.5%
*Math Problems	26	53 %	3	6.5%
*Handwriting		0	0	0
*Considered Underachiever	9	18 %	6	13 %
*Behavior Deficits	7	14 %	5	10.9%
Total Problems 125	** (109) 96	76 %	** (30) 29	24 %

*Starred school problems do not include specific problems of classified students--they were not reported.

50% of males have diabetic family history

9.52% of males are classified

**If students have multiple problems and are in both compensatory education classes (Reading and Mathematics), they are counted twice in these figures.

It is possible to draw some interesting conclusions from tables 5 and 6. Students with a family history of diabetes have multiple problems.

When there was no family background of diabetes, the difference between males and females is in the behavior deficit and underachiever areas only. The problems in reading and mathematics found in students without a family history of diabetes are the same for males and females and does not follow the pattern of more males having learning problems than females as shown in the research literature on learning disabilities and documented in this investigation for the group with a family history of diabetes.

We believe this further substantiates our theory that the genetic or metabolic factors in a diabetic family history is the primary cause of these learning problems.

Swedesboro-Control Group

Compilation of statistics comparing control group (those females with no family diabetic history) from Swedesboro-Walter Hill School, (grades 1 to 6) with original group of students identified as having a family history of diabetes and the incidence of specific school related problems in each group.

Swedesboro - Walter Hill School

TABLE # 5 Females-Grades 1 to 6 (including Transitional 1st Grade)

CONTROL GROUP

School Problems	With Diabetic Background 46 Students * 46 Not Classified		Without Diabetic Background 33 Students * 32 Not Classified	
	Number (Problem Incidence)	Percentage	Number (Problem Incidence)	Percentage
Spec. Ed. Classification	0	0%	1	3%
*In Compensatory Ed. Class	**(22) 13	28%	**(10) 7	21%
*Reading Problems	11	24%	6	18%
*Math Problems	9	20%	4	12%
*Handwriting	1	2%	0	0%
*Considered Underachiever	0	0%	2	6%
*Behavior Deficits	1	2%	2	6%
Total Problems 57	** (44) 35	53%	**(25) 22	47%

*Starred school problems do not include specific problems of classified students--they were not reported.

58' of Swedesboro female students have a diabetic family history
of Swedesboro females are classified.

**I ents have multiple problems and are in both compensatory classes (: g and mathematics) they are counted twice in these figures.

Swedesboro-Control Group

Compilation of statistics comparing control group (those males with no family diabetic history) from Swedesboro-Walter Hill School, (grades 1 to 6) with original group of students identified as having a family history of diabetes and the incidence of specific school related problems in each group.

Swedesboro - Walter Hill School

TABLE # 6 Males-Grades 1 to 6 (including Transitional 1st Grade)

CONTROL GROUP

School Problems	With Diabetic Background 65 Students 54 Not Classified		Without Diabetic Background 34 Students 24 Not Classified	
	Number (Problem Incidence)	Percentage	Number (Problem Incidence)	Percentage
Spec. Ed. Classification	11	17 %	10	29.4%
*In Compensatory Ed. Class	** (27) 17	31.5%	**(5) 4	16.7%
*Reading Problems	18	33 %	4	16.7%
*Math Problems	17	31.5%	1	4 %
*Handwriting	10	18.5%	1	4 %
*Considered Underachiever	1	2 %	3	12.5%
*Behavior Deficits	(7 not related to academic problems) 13	24 %	(7 not related to academic problems) 9	37.5%
Total Problems 119	** (97) 87	55 %	**(33) 32	45 %

*Starred school problems do not include specific problems of classified students--they were not reported.

66% of males have diabetic family history
21.2% of males are classified

**If students have multiple problems and are in both compensatory classes (reading and mathematics) they are counted twice in these figures.

Lower Township-Control Group

Compilation of statistics comparing control group (those females with no family diabetic history) from Lower Township, (grades 3 to 6) with original group of students identified as having a family history of diabetes and the incidence of specific school related problems in each group.

TABLE # 5 Lower Township-Females-Grades 3 to 6

School Problems	With Diabetic Background 110 Students 106 Not Classified		CONTROL GROUP Without Diabetic Background 87 Students 83 Not Classified	
	Number (Problem Incidence)	Percentage	Number (Problem Incidence)	Percentage
Spec. Ed. Classification	4	3.7%	4	4.6%
*In Compensatory Ed. Class	**(24) 17	16 %	**(18) 13	15.7%
*Reading Problems	18	17 %	13	15.7%
*Math Problems	12	11.3%	6	7.2%
*Handwriting	4	3.7%	1	1.2%
*Considered Underachiever	0	0 %	1	1.2%
*Behavior Deficits	4	3.7%	2	2.4
Total Problems 99	**(66) 59	54 %	**(45) 40	46 %

*Starred school problems do not include specific problems of classified students--they were not reported.

56% of females have a diabetic family history
4.2% of females are classified

**If students have multiple problems and are in both compensatory classes (reading and mathematics) they are counted twice in these figures.

Lower Township-Control Group

Compilation of statistics comparing control group (those males with no family diabetic history) from Lower Township, (grades 3 to 6) with original group of students identified as having a family history of diabetes and the incidence of specific school related problems in each group.

TABLE # 6 Lower Township-Males-Grades 3 to 6

CONTROL GROUP

School Problems	With Diabetic Background 116 Students 97 Not Classified		Without Diabetic Background 98 Students 82 Not Classified	
	Number (Problem Incidence)	Percentage	Number (Problem Incidence)	Percentage
Spec. Ed. Classification	19	16.4%	16	16.3%
*In Compensatory Ed. Class	**(36) 22	23 %	** (14) 9	11 %
*Reading Problems	28	29 %	14	17 %
*Math Problems	18	19 %	10	12 %
*Handwriting	11	11 %	4	5 %
*Considered Underachiever	6	6 %	8	10 %
*Behavior Deficits	23	24 %	13	16 %
Total Problems 201	** (141) 127	59.2%	** (79) 74	40.8%

*Starred school problems do not include specific problems of classified students--they were not reported.

54% of males have diabetic family history
16.4% of males are classified

**If students have multiple problems and are in both compensatory classes (reading and mathematics) they are counted twice in these figures.

Combined-Control Groups

Compilation of statistics comparing combined control group (those females with no family diabetic history) from the three districts, (grades 1 to 8) with combined original groups of students identified as having a family history of diabetes and the incidence of specific school related problems in the combined group.

TABLE # 5

3 SCHOOLS COMBINED
Female-Grades 1 to 8

CONTROL GROUP

School Problems	With Diabetic Background 211 Students 201 Not Classified		Without Diabetic Background 187 Students 178 Not Classified	
	Number (Problem Incidence)	Percentage	Number (Problem Incidence)	Percentage
Spec. Ed. Classification	10	4.7%	9	4.8%
*In Compensatory Ed. Class	** (73) 45	22.4%	** (35) 27	15.3%
*Reading Problems	42	21 %	22	12.5%
*Math Problems	37	18.4%	15	8.5%
*Handwriting	5	2.5%	1	.6%
*Considered Underachiever	3	1.5%	6	3.4%
*Behavior Deficits	6	3 %	6	3.4%
Total Problems 234	**(176) 148	60.4%	** (94) 86	39.6%

*Starred school problems do not include specific problems of classified students--they were not reported.

53% of all females have diabetic family history
4.8% of females are classified

**If students have multiple problems and are in both compensatory classes (reading and mathematics) they are counted twice in these figures.

Combined-Control Groups

Compilation of statistics comparing combined control group (those males with no family diabetic history) from the three districts, (grades 1 to 8) with combined original groups of students identified as having a family history of diabetes and the incidence of specific school related problems in the combined group.

TABLE # 6

3 SCHOOLS COMBINED
Males-Grades 1 to 8

School Problems	With Diabetic Background 233 Students 200 Students Not Classified		CONTROL GROUP Without Diabetic Background 185 Students 152 Students Not Classified	
	Number (Problem Incidence)	Percentage	Number (Problem Incidence)	Percentage
Spec. Ed. Classification	33	14.2%	33	17.8%
*In Compensatory Ed. Class	**(103) 66	33 %	** (75) 18	11.8%
*Reading Problems	70	35 %	21	13.8%
*Math Problems	61	30.5%	14	9.2%
*Handwriting	21	10.5%	5	3.3%
*Considered Underachiever	15	7.5%	17	11.2%
*Behavior Deficits	43	21.5%	27	17.8%
Total Problems 444	**(346) 309	63.5%	**(142) 135	36.5%

*Starred school problems do not include specific problems of classified students--they were not reported.

55.7% of all males have diabetic family history
15.8% of all males are classified

**If students have multiple problems and are in both compensatory classes (reading and mathematics) they are counted twice in these figures.

Other Findings

Results from 3 Schools Combined (Grades 1 to 8)

(Palmyra, Swedesboro, Lower Township)

Males

1. Of the 84 individual male students in Compensatory Education programs 66 or 78.6% have a diabetic family history; and 18 or 21.4% do not have such a history.

2. Of the 128 male students in all compensatory education classes, 103 or 80.5% have a family diabetic history and 19.5% have no diabetic family history.

   * The difference between statements 1 and 2 is the results of the finding that more students with a family history of diabetes have multiple problems, and tend to be in both Compensatory reading and math, and may have handwriting and/or behavior problems, while the students with no diabetic history tend to have a problem in a specific area.

3. Of the 91 male students with reading problems, 70 or 77% have a family diabetic history and 21 or 23% do not.

4. Of the 75 male students that have problems with mathematics, 61 or 81.3% have a diabetic family history and 14 or 18.7% do not.

5. Of the 26 male students with handwriting problems, 21 or 80.7% have a family history of diabetes and 19.3% do not have the history.

6. Of the 70 students that have behavior problems, 43 or 61.4% have a family history of diabetes and 38.6% do not have such a history.

Other Findings

Results from 3 Schools Combined (Grades 1 to 8)

(Palmyra, Swedesboro, Lower Township)

Females

1. Of 72 individual students in Compensatory Education 45 or 62.5% had diabetes family history and 27 or 37.5% had no diabetic family history.

2. Of the 108 students in all Compensatory Education classes 73 or 67.6% have diabetes family history, 35 or 32.4% have no diabetic family history.

   * The difference between statements 1 and 2 is the results of the finding that more students with a family history of diabetes have multiple problems, and tend to be in both Compensatory reading and math, and may have handwriting and/or behavior problems, while the students with no diabetic history tend to have 1 problem in a specific area.

3. Of the 64 students with reading problems 42 or 65.6% have diabetic family history and 22 or 34.4% have no diabetic family history.

4. Of the 52 students with math problems 37 or 71.2% have diabetic family history and 15 or 28.9% have no diabetic family history.

5. Of the 6 students with handwriting problems 5 or 83.3% have diabetic family history 16.7% have no diabetic family history.

6. Of the 12 students that have behavior problems 6 or 50% have a family diabetes history and 50% do not have a diabetic family history.

Genetic Diabetic History of Student Grades 1 to 8 (444 Students)

From 3 Schools Combined

Project - To explore the possibility of a connection between a family history of diabetes mellitus and school learning and/or behavior problems in students in grades one to eight.

We believe there is an urgent need to investigate this problem because of the documented increase in diabetes statistics.

"In 1963 (Klosovskii) stated in his research that the number of patients which diabetes mellitus is continually increasing in all countries of the world." According to information given in the literature, of every 500 new-born infants, one is born from a mother suffering from diabetes mellitus (Barnes and Morgan 1949)."

Statistics in "Normal Theraputic Nutrition" (1977) place the rate of diabetes among persons under 25 at 2.3 per thousand, for persons over 45, 62 per thousand. The disease is much more prevalent in lower economic groups. Women are somewhat more susceptable to diabetes than are men. The disease occurs with striking frequency among blood relatives. (Diabetes Source Book, Public Health Service, 1969)

Over the last few decades, diabetes has escalated at an alarming rate constituting a major health problem. (The Diabetes Educator-Winter 1979-80)

The statistics from this study we are working on shows further increases.

1. One out of every 42 males under age 14 has a mother with diabetes - 80% have learning problems.

2. One out of every 17 females under age 14 has a mother with diabetes - 29% have learning problems.

3. One out of 60 males has a father with diabetes - 57% have learning problems.

4. One out of 50 females has a father with diabetes - 50% have learning problems.

5. 4.78 males under age 14 per thousand have juvenile diabetes - (Statistics in "Normal Theraputic Nutrition" (1977) above.

6. 7.52 females under age 14 per thousand have juvenile diabetes - (Statistics in "Normal Theraputic Nutrition" (1977) above.

7. The students who have juvenile diabetes have a family history of diabetes on both sides of their family, paternal and maternal. In 4 out of the 6 cases the paternal grandfather is identified as a diabetic.

   One out of every 6.25 males has a maternal grandmother with diabetes and 67% of these students have learning and/or behavior problems.

One out of every 6.50 females has a maternal grandmother with diabetes and 35% of these students have learning and/or behavior problems.

In all cases one out of 10 male and female students had a maternal grandfather, paternal grandmother or paternal grandfather with diabetes.

54% of all students (444 out of 816) have a diabetic family history. Of this number 27% of both males and females have this history in the extended family only. This includes great grandparents and other relatives (not parents or grandparents).

IQ Statistics - (Palmyra)

Students with Diabetic History - With School Related Problems

		Low IQ Below 90	Average IQ 90 to 110	High IQ Over 110
Females	(14)	7.1%	78.6%	14.3%
Males	(33)	3 %	57.6%	39.4%

Students with a Diabetic Family History - No School Problems

Females	(31)	3.2%	48.4%	48.4%
Males	(15)	0 %	40 %	60 %

Students No Diabetic Family History - With School Problems

Females	(8)	37.5%	50 %	12.5%
Males	(5)	20 %	60 %	20 %

Students with No Diabetic Family History - No School Problems

Females	(54)	1.9%	61 %	37 %
Males	(39)	0 %	41 %	59 %

Use of IQ information is a limitation of this study, only in Palmyra was the same test given to all students, but these statistics were given to us early in the school year and the IQ of ten new students were not available. We also received no scores for classified students.

The scattered scores from the other 2 districts were really not usable, although those we received showed many more students with low IQ scores.

The Palmyra figures above are never-the-less interesting and lead to the tentative conclusion that even though more males have academic problems, they do not seem to be as closely related to their measured intelligence, as is the case with females. The males seem to have more academic problems but higher IQ's. We have been able to find very little research regarding this. This could be investigated in a further study with more accuracy under controlled testing.